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ABSTRACT
                Preschoolers' event descriptions indicate that they
are able to engage in displaced reference, use timeless verb forms,
report optional and conditional relationships, appropriately sequence
events, engage in temporal reversibility, and appropriately use a
number of relational terms, all at a much younger age than has
traditionally been believed possible. These findings contradict the
results of a number of studies and challenge the theories developed
to account for those results. If 3- and 4-year-olds understand
temporal and logical relationships well enough to describe them
linguistically, assertions cannot be accepted that claim
"preoperational" children necessarily cannot comprehend such
relationships. Nor can componential models of lexical acquisition be
accepted if predictions made by the models find no support in
production data. While the present data indicate that preschoolers
have cognitive abilities they were thought to lack, it is likely that
the children's abilities are limited to certain highly meaningful and
well-represented contexts. The nature of young children's limitations
in these domains, and the processes by which they overcome them, are
topics for future research. (Tables provide examples of event
descriptions, expressions of options and conditions, self-corrections
of temporal sequences, and the production of relational terms.)
(RH)

LANGUAGE IN SCRIPTS

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Language in Scripts

Asking preschoolers to describe familiar events establishes an expository discourse context quite different from either the naturalistic or experimental settings in which language ability is typically assessed. Within this discourse context, preschoolers exhibit cognitive and linguistic competencies not tapped by more traditional measures. This suggests that standard paradigms may have resulted in underestimations of preschoolers' language abilities. It also raises questions about theories developed to account for preschoolers' "language deficits," and so has implications with regard to models of cognitive development.

The data to be described are based upon approximately 700 protocols obtained by asking 43 children between 2;11 and 5;6 to describe six events three times each. The events included getting dressed, going to the grocery, going to a restaurant, having a fire drill, making cookies, and having a birthday party. These descriptions were elicited by asking "What happens when you...?" Non-directive probes such as "anything else?" and "can you tell me more?" were provided until the child indicated that she had nothing else to say about an event. The only props were cards with the event names written on them.

The questions eliciting the event descriptions did not give any clues as to either what specific information the descriptions should contain or how the descriptions should be structured. This point is stressed because, for the data we will be describing, it is important to realize that both the content and form of the event descriptions were spontaneously and independently constructed by the children.

The data provide evidence that preschoolers engage in displaced reference, use timeless verb forms, have a good command of temporal relationships, including, at least for some of the children, an ability to engage in temporal reversibility, that they appreciate the hypothetical and conditional nature of events, and that they use appropriately a number of relational terms, such as before, after, because, so, if, but, and or, that previous research has suggested require cognitive abilities preschoolers lack.

Event descriptions as a discourse format

Expository speech, that is, explaining to someone what you know about something, is a discourse form unlikely to be frequently called for in preschoolers' daily life. Nevertheless, preschoolers respond readily to requests that they describe familiar events. Some examples of their event descriptions are shown in Table 1.

Insert Table 1 about here

Preschoolers' adoption of an expository discourse form results in some uses of language that are of especial interest because they do not occur in the more typical contexts for studying children's language abilities. In both naturalistic and experimental studies of language ability, the child's attention, and therefore her spontaneous speech, tends to be focused on the immediately present environment. Because most of the recorded speech of young children refers to the "here-and-now", there is a widespread belief that preschoolers are unable to engage in displaced reference, presumably due to cognitive limitations. The event descriptions are clearly divorced from the immediate context, and illustrate that preschoolers are quite able to talk without the support provided by the immediately perceptible

environment (see also Sachs, in press).

Preschoolers' adoption of an expository discourse mode results in related linguistic phenomena that are absent from their speech in the settings in which speech samples are usually collected. Event descriptions are usually given in general rather than specific terms. That is, children typically describe "what happens" in general rather than "what happened" on a particular occasion. This too implies a need to revise traditional assumptions regarding preschoolers' ability to generalize and form abstractions. (See Nelson, in preparation, for a fuller discussion of these issues).

Linguistic corollaries of the generalized nature of the event descriptions include the use of the general, impersonal pronoun forms you and we and timeless verb forms; that is verbs not referring to past, present, or future time. For example, the statement You eat and you drink, made by a child of 2;11, contains both the general you and timeless verbs.

The use of timeless verbs is of special interest, because the children studied in Roger Brown's (1973) longitudinal study did not use timeless expressions until about age four (Cromer, 1968). Cromer (1968) and McNeill (1979) attributed the relatively late appearance of this simple grammatical construction to cognitive limitations, suggesting that prior to age four children cannot decenter sufficiently to use timeless expressions. Our finding that children produce timeless expressions by their third birthday indicates that they must have the prerequisite cognitive abilities at that time. Timeless expressions are appropriate only within a limited range of discourse contexts, however, and we suspect that Adam and Sarah's speech was not sampled in such contexts.

Understanding options

Just as the expository discourse mode adopted for event descriptions supports the use of linguistic forms that are infrequently observed in young children's speech, the nature of the events themselves leads to language use that is of interest in light of earlier claims regarding preschoolers' linguistic and cognitive limitations. Although they have some sort of invariant "core", events are rarely identical across individual occurrences. For example, while certain core components of getting dressed remain constant, there are also a number of optional components depending on season, plans, mood, and, as some of our subjects were quick to point out, what happens to be clean. The existence of such options is acknowledged in young children's event descriptions, indicating that they are aware of co-ordinate classes and capable of conditional and/or hypothetical reference. The terms most frequently used to mark optional possibilities in the instantiation of an event are or and if. The examples in Table 2 illustrate the use of these terms.

Insert Table 2 about here

The statements containing or can be interpreted as showing an awareness of coordinate classes since, in natural language, or generally links mutually exclusive items that are members, at equivalent levels of specificity, of the same category (Ford, 1976).

The traditional position that preschoolers are incapable of hypothetical thought has recently been challenged by Stan Kuczaj's (Kuczaj & Daly, 1979; Kuczaj, 1891)

study of preschoolers' spontaneous productions of hypothetical statements and their responses to hypothetical questions. Many of our subjects' conditional statements also have a hypothetical flavor, although their "timelessness" means that they do not contain the verb forms generally associated with hypothetical statements. It is interesting to speculate about how preschoolers acquire their initial knowledge of conditionals and alternatives. In order to describe alternatives and conditionals, one needs not only a conversational topic that involves such relationships, but also an understanding of those relationships. Scripted events seem to offer an ideal context for acquiring knowledge about, and therefore being able to talk about, options. Repeated encounters with an event leads to an awareness of which elements are constant, which optional, and which dependent upon optional conditions. Such repeated encounters may constitute the child's first systematic experience with alternative and conditional relationships, and so seem a likely source for the development of an understanding of such relationships.

Temporal Structure

The structure of their event descriptions offers insight into preschoolers' cognitive organization and cognitive ability. The standard interpretation of Piaget's position has been that the construction of temporal sequences relies upon the attainment of temporal reversibility, and therefore is not within the capabilities of preoperational children. There have been a number of challenges to this position (Stein and Trabasso, 1982; Brown, 1976; Brown & French, 1976; Brown & Murphy, 1975; Clark, 1973), but no one has directly addressed the issue of whether preschoolers can form stable mental representations of personally experienced events, and so have not addressed Fraisse's (1963) claim, based upon his interpretation of Piaget's position, that "the memories of young children are completely jumbled up, for they have not learned to reconstruct their past...(p. 254).

The event descriptions address questions about children's memory for personally experienced sequences, the stability of these sequences, and children's ability to carry out temporal reversals. Children questioned about the same event on two occasions are highly consistent in terms of both the event elements mentioned and in the sequencing of those elements (Nelson, Fivush, Hudson, & Lucariello, 1982). An analysis of one set of the restaurant protocols produced by our 43 subjects revealed that the majority of these children mentioned two or more elements having an invariant real world order (e.g. ordering followed by being served followed by paying followed by leaving) and virtually aways ordered these elements appropriately (French & Nelson, 1981; 1982; 1983). These same children were responsible for producing nearly 700 protocols containing several thousand individual elements; there were only 19 instances in which the correct order of elements having an invariant real world sequence were misordered. These misorderings were primarily cases in which the conventional means of expression violates the actual order of occurrence, as in "I put on my shoes and socks" or cases in which an element was mentioned twice, one in an incorrect, then in the correct position, as in "You just sit, you come in and sit down."

The protocols also provide evidence of temporal reversibility. If, in describing sequenced events, a speaker omits an element from its proper position and later remembers it, it is necessary that she indicate where the element fits into the sequence being described. Several of our subjects made such adjustments, which we have termed temporal repairs. Some examples are shown in Table 3.

Insert Table 3 about here

Temporal repairs such as these indicate that in addition to having a mental representation of the temporal structure of the events being described, the speaker can move bidirectionally within that representation. Since these two factors meet Piaget's criteria for assigning temporal reversibility (Ferreiro & Sinclair, 1971), such temporal repairs are highly unexpected in the speech of children younger than six or seven.

Relational terms

Words such as before, after, because, so, if, or, and but conjoin propositions, and, in doing so, report the relationship between the events described in those propositions. Virtually all investigations of the age at which these relational terms are acquired have found their acquisition to be late relative to most language, with a lower age limit of about five for before and after (Clark, 1971), and an upper limit of high-school age for the acquisition of or (Neimark, 1970; Neimark & Slotnick, 1970). Because and if were found to be comprehended at about eight years (Emerson, 1979; 1980).

There have been two basic types of accounts given for preschoolers' failure to comprehend relational terms. One set of investigators has accounted for their late acquisition in terms of cognitive limitations, claiming that understanding the terms depends upon a level of cognitive ability which preschoolers lack. Other investigators have adopted various versions of a semantic feature model which holds that words consist of various meaning features which may be acquired one component at a time. Under this model, a child may have partial understanding of a term, and therefore systematically misinterpret it.

It has been claimed that after is misinterpreted as before because children acquire the feature "prior" earlier than the feature "subsequent" (Clark, 1971) and apply it to both terms. Similarly, it has been claimed that children understand the causal component of because and if two or three years before they understand the order component of these terms. That is, children understand that the terms express a causal relationship between propositions much earlier than they understand that the terms must introduce the antecedent rather than consequent clause. This conclusion was reached because until about age eight children will judge "reversed" because- and if-sentences such as "It starts to rain because I put up my umbrella" as sensible (Emerson, 1979, 1980). Similar arguments have been made with regard to but and or, with claims that these terms are interpreted as if they were synonymous with and earlier than they are understood as expressing adversative and alternative relationships (Kail, 1980; Paris, 1973).

If these models, developed on the basis of comprehension studies, validly describe young children's understanding of the terms, they should make systematic production errors, for example, use after where before would be appropriate, introduce consequent clauses with because and if, use but and or where and would be more appropriate, and so forth.

The event descriptions contained numerous productions of before, after, because, so, if, or, and but, and so we were able to see how well the predictions that could be drawn from comprehension studies held up in production. In fact, they did not hold up at all. All the relational terms were virtually always used appropriately, with no evidence of the sorts of partial knowledge posited by other investigators. Some examples of how these terms were used are shown in Table 4. It is important to note

that our subjects were younger than the children participating in most of the comprehension studies.

Support for our general finding of error free use of the relational terms is offered by the research of Bloom and her colleagues (Bloom, Lahey, Hood, Lifter, & Fiess, 1980; Bitetti-Capatides, Fiess, & Bloom, 1980; Fiess, Bittetti-Capatides, & Bloom, 1979; Hood & Bloom, 1979), who have collected productions of several of these terms from two-year-olds and found that, by and large, they are used correctly from their first occurrence in the child's speech. Neither Bloom nor those carrying out the comprehension studies have directly addressed the disparity raised by children's accurately producing these terms at a much earlier age than they appear to comprehend them. That seems to us to be a crucial issue, for the comprehension studies may not be tapping what they are intended to tap, that is, comprehension of the terms themselves.

Elsewhere, we (French & Nelson, 1983) have presented our production data for these relational terms. We have discussed how these data extend Bloom's production data, and are contrary to predictions that follow from the bulk of the comprehension data. Here I can give only a brief overview of how we have tried to account for this production/comprehension disparity. Basically, we propose both that comprehension studies may not be tapping what they were intended to tap and that context may be a crucial variable supporting the correct productions we obtained.

Especially for younger subjects, comprehension studies may not validly assess comprehension of the target terms. This is especially important in attempting to account for performance failure. All experimental tasks involve multiple task demands, and a child may perform poorly because she is unable to comply with a secondary task demand rather than because she doesn't understand the term being assessed. For example, a number of comprehension studies demand grammaticality judgments. Such judgments involve metalinguistic skills in addition to simple lexical knowledge, and it is generally acknowledged that the ability to reflect upon language is a higher order skill than is simply "knowing" language.

"Context" is the other variable we believe is responsible for the production/comprehension disparity found for relational terms. Representations of routine events are one of the best established and most stable forms of knowledge that young children have (Nelson & Gruendel, 1981), and so provide an optimal context for assessing the child's cognitive and linguistic abilities. We suggest that our subjects' well-established knowledge of the events they described supports the appropriate use of the relational terms. That is, they understood the temporal and logical relationships they choose to mention, and could easily select the terms appropriate for describing these relationships.

To briefly summarize, preschoolers' event descriptions indicate that they are able to engage in displaced reference, use timeless verb forms, report optional and conditional relationships, appropriately sequence events, engage in temporal reversibility, and appropriately use a number of relational terms, all at a much younger age than has traditionally been believed. These findings contradict the results of a number of other studies. More importantly, they challenge the theories developed to account for those findings.

If three- and four-year-olds understand temporal and logical relationships well enough to describe them linguistically, we can no longer accept claims that the understanding of these relationships is necessarily beyond the capabilities of "preoperational" children. Nor can we accept the componential models of lexical acquisition if the predictions made by these models find no support in production data.

While claiming that our data do indicate that preschoolers have cognitive abilities they were previously believed to lack, we are not suggesting that their control of these abilities is identical to that exercised by older children and adults. It is very likely that the cognitive and linguistic abilities that we have documented are limited to certain highly meaningful and well-represented contexts. The nature of young children's limitations in these domains, and the processes by which they overcome them are exciting directions for future research.

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TABLE 1: EXAMPLES OF EVENT DESCRIPTIONS

S# 3; 3;1 Getting Dressed

Well; you put on your clothes and you eat breakfast!!

S# 8; 3;7 Getting Dressed

You put on your socks and shoes. I have shoes, they're dirty. Then you get ready to go. And eat your breakfast. When you come back from school, you eat lunch.

S#12; 3;10 Making Cookies

I bake them and clake them. And my mommy helps me. No, my mommy makes them and I help her. And my daddy just wants to eat them. Like chocolate chip cookies. I had one before we came here.

S#20; 4;3 Getting Dressed

Well; sometimes I put on dresses and sometimes I put on pants, and really long dresses....Sometimes I wear shirts and sweaters and skirts.

S#24; 4;7 Going to a Restaurant

You just sit. You come in and sit down. And a waiter comes along. And just — and — you order your food. (Probe) And then the waiter comes back with your food and you eat it. (Probe) You pay and then you go out.

S#25; 4;7 Getting Dressed

Put your clothes on; eat breakfast, go to work or to school, that's it.

S#31; 4;9 Birthday Party

You make a cake; put it in the oven, you make the dough, and put it in the oven, let it bake. Then take it out when it's ready and put in candles how much you gotta, and you light them and then you blow them out. That's all.

S#37; 5;1 Going to the Grocery

Well; you get to buy food. Sometimes they have special food that you buy, — and cereal, juice, whatever you want. Sometimes they have little toys for children. Sometimes they have doggy toys. Sometimes they have — whatever you want.

·S#40, 5;5 Making Cookies

First what we do is we clean up the tables. And then we make the cookies. Then we usually eat them.

S#42, 5;6 Birthday Party

Well, when you have a birthday, you get up early in the morning, get dressed, and you to to the birthday party, and um, you; and you get a hat at the birthday party, and you play games, and when the cake's ready, you sit down, and you get a piece,and you eat it up, and then when it's time to go, you go!

TABLE 2: EXPRESSING OPTIONS AND CONDITIONS

...well, you see, after,if you eat your food up, you get dessert. (S# 16, 4;0)

Well, when the thing that moves doesn't move, sometimes I wanta go up there, if it's not glass. (S# 19, 4;2, speaking of grocery store conveyer belt.)

Well, my mom always gets angry with me if I put the wrong things out and she uses them when she's not supposed to use those things. (S# 29, 4;8).

You could, you could - get in dresses, or, you can get in pants or shorts. But if it's in the summer and you get on pants, too hot. But if you get in pants in the winter, medium. But if you get in a dress in the summer, that's good, too. (S# 38, 5;4)

And then we buy some stuff and then we go home or go to school or go to Stuart's. (S#15, 4;0)

I sometimes, I put an undershirt on, sometimes I put a slip on. Then I put a dress or pants or shorts or skirt, and then I put a shirt on...(S# 37, 5;1, Note distinction between use of "and" and "or".)

I put on my underpants, then my shorts or pants. (S# 41, 5;6)

TABLE 3: TEMPORAL REPAIRS

She gots something out to bake muffins with., But first she has to buy some things for muffins. (S#1, 2;11)

You know what I do is, I just blow off the candles and eat it. And before I eat it, I just take out all the candles. (S#17, 4;1)

And um, the person will open it. And take off, take off the ribbon before they open it, and they'll find out what's inside. (S#24, 4;7)·

Make the dough. And then you put it in the oven. But before you put it in the oven, you make the cookie shapes and then you put it in the oven. And then when the bell rings, you take out the cookies. (S#24, 4;7).

Sit down. And eat, eat supper. Pay, go home. First, buy a piece of cake and then go home. Go to bed. And then go to sleep. (S#25, 4;7)

I get dressed, then I wait for my friends, no, then I play with my friend, then when it's time to go in, and it's ready for the party, I wait for my friends...(S#43, 5;6).

TABLE 4: PRODUCTIONS OF RELATIONAL TERMS

...and then you tell the waiter what you eat, what you wanna eat, and then, then you eat _after_ the waiter gives ya it. (S# 13, 4;0)

After I get dressed, I just go to school. (S# 17, 4;1)

Go out and play. Umm, _after_ that, ice cream and cake. And _after_ that, go home. (S# 36, 5;0)

Like chocolate chip cookies. I had one _before_ we came here. (S# 12, 3;10)

...then when we're finished eating the salad that we order, we get to eat our pizza when it's done, _because_ we get the salad _before_ the pizza's ready. (S# 34, 4;10)

You walk fast _but_ you can't put your coats on _cause_ you need to hurry. (S# 19, 4;2).

What you do is put them in the oven to bake (Yeah), _because_ they have to be hot when you eat them. (S# 42, 5;6).

Once when I was having a fire drill I had a sweater on so I didn't, so I, _so_ I wasn't cold. .(S# 19, 4;2).

You need to make them brown, so, _so_ you can eat them. (S# 11, 3;9)

Well, usually I like things that have a pocket _so_ I can carry things in the pocket. (S# 19, 4;2).

Don't run _or_ talk _or_ jump. _But_ you have to stay in line _so_ you don't get lost. (S#20, 4;3)